

CBFO RISK MANAGEMENT PLAN



Revision 4

November 2010

This document supersedes DOE/CBFO 03-3292, Revision 3

**U. S. DEPARTMENT OF ENERGY
CARLSBAD FIELD OFFICE**

CBFO RISK MANAGEMENT PLAN

DOE/CBFO 03-3292

Revision 4

Submitted by: signature on file Date: 11-29-2010

Donald C. Gadbury
Federal Project Director

Approved by: signature on file Date: 11-30-2010

Ed Ziemianski
Acting Manager, Carlsbad Field Office

Table of Contents

1.0	INTRODUCTION	4
2.0	PROGRAM DESCRIPTION	4
3.0	PERFORMANCE BASELINE DEVELOPMENT	6
4.0	RISK SUMMARY	6
5.0	RISK MANAGEMENT.....	7
5.1	Risk Identification.....	7
5.2	Risk Assessment	7
5.2.1	Risk Event Consequences	8
5.2.2	Risk Event Probability	9
5.2.3	Risk Consequence Matrix	9
5.3	Risk Analysis and Quantification	9
5.4	DOE Unfunded Contingency and Management Reserve	11
5.5	Risk Mitigation	12
5.6	Risk Monitoring and Continual Assessment.....	12
6.0	REFERENCES	12
	Attachment 1 - Risk Management Assessment	13

1.0 INTRODUCTION

The Carlsbad Field Office (CBFO) Risk Management Plan (RMP) describes the Waste Isolation Pilot Plant (WIPP) risk identification, assessment, quantification, mitigation, and monitoring process. The RMP is structured to contain a concise description of the strategy and framework elements essential to the risk management processes, culminating with the Risk Management Assessment and development of the U. S. Department of Energy (DOE) management reserve (MR) and unfunded contingency (UC) for the Office of Environmental Management (EM) projects, using Monte Carlo analysis. The RMP and Risk Management Assessment enable the early identification of and the proactive response to risk items. The goal of the RMP is to develop actions to respond to risks while reducing or eliminating uncertainties, thereby increasing the probability for program success in accordance with DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*, dated 7-28-06. EM notified CBFO on August 31, 2009, that Project Baseline Summaries (PBS) CB-0080.01, Operate Waste Disposal Facility, and CB-0090.01, Transportation, do not contain activities that constitute capital asset work and have been determined to be “operations” activities; however, these activities will continue to be managed with scope, cost, and schedule discipline. In addition, PBS CB-0081.01, Central Characterization Project, is not to be managed as a capital asset project, but is included in the RMP. In keeping with that direction, CBFO continues to use Order 413.3A as guidance to revise and update the RMP until such time as additional definition, process, and operations protocol is agreed to regarding this designation change.

2.0 PROGRAM DESCRIPTION

WIPP is designed to permanently dispose of transuranic (TRU) waste generated by production and testing of nuclear weapons and other defense-related activities. It is the cornerstone of DOE’s national TRU waste clean-up strategy. CBFO is responsible for:

- directing and coordinating the implementation of TRU waste characterization and transportation across the nation (management of the National TRU Program)
- assessing compliance with TRU waste regulations and program guidance
- promoting commonality among the plans, activities, and assumptions of all TRU waste sites (standardization)
- developing and updating TRU waste acceptance criteria as the driving requirements change
- performing TRU waste certification and recertification audits and inspections to certify/recertify TRU waste sites to characterize and package TRU waste for transportation and ultimate disposition
- providing for the safe transportation of the waste from the TRU waste sites to the WIPP, or to a certified TRU waste site for characterization to meet WIPP disposal requirements if the waste originates from a non-certified TRU waste site
- disposing of TRU waste in the WIPP

DOE recognized the interdependency of the TRU waste complex and the need to coordinate many activities necessary to characterize, transport, and dispose of TRU waste at WIPP. To address this need, DOE organized a National TRU Waste Corporate Board, consisting of federal and contractor TRU waste managers from across the TRU waste complex, to ensure that all activities related to TRU waste are coordinated and integrated.

CBFO has established a team of federal staff and contractors focused on a common goal to safely, compliantly, and efficiently dispose of the nation's TRU waste. Washington TRU Solutions, LLC (WTS) is the management and operating (M&O) contractor responsible for ensuring appropriate controls exist for the successful integration and completion of projects in the TRU waste characterization, transportation, and disposal programs. WTS directly manages the Central Characterization Project (CCP). The CCP provides TRU-related services to sites that either do not have sufficient infrastructure to characterize TRU waste or that need supplemental characterization assistance to meet the requirements of the WIPP Waste Analysis Plan (WAP) at a rate that supports reasonable site closure schedules. WTS also directly manages WIPP site operations, including TRU waste disposal, mining, and support functions. The Idaho National Laboratory (INL) Transuranic Waste Characterization Program (TWCP) provides additional waste characterization analysis services to the TRU waste complex as needed.

In the area of transportation, WTS provides technical coordination by developing the near-term (8-week rolling) shipping schedule and interfacing with the two transportation carrier contractors. CAST Specialty Transportation, Inc. (CAST) and Visionary Solutions provide the shipping resources necessary to transport TRU waste from all DOE TRU waste sites to the WIPP. NetGain Corporation provides services for managing and operating the Transportation Tracking and Communications (TRANSCOM) system for tracking shipments of TRU waste and other select high-visibility DOE shipping campaigns.

Sandia National Laboratories (SNL) conducts experimental programs and performance assessment activities required to show that the waste disposal system can safely isolate TRU wastes from the environment for 10,000 years. Los Alamos National Laboratory (LANL) provides technical support in the areas of TRU waste characterization and transportation, loading, TRU waste program optimization, TRU waste inventory, and actinide chemistry experimental programs. The CBFO Technical Assistance Contractor (CTAC) provides expert technical assistance in the areas of safety, environmental compliance, inspections, surveillances, and quality assurance (QA). In accordance with DOE/CBFO-94-1012, *Quality Assurance Program Document*, CTAC also performs certification/recertification audits and assessments of the TRU waste generator sites, the WIPP M&O contractor, SNL, LANL-Carlsbad, the transportation contractors, CBFO, and other CBFO program participants.

3.0 PERFORMANCE BASELINE DEVELOPMENT

WIPP performance baseline development, definition, and control processes are described in DOE/CBFO 03-3293, *CBFO Project Execution Plan (PEP)*, which was developed prior to the PBSs being designated as operations activities. This document contains a concise description of the processes for developing and maintaining the CBFO life-cycle performance baseline, including life-cycle cost estimates, budget development, work breakdown structure, cost and schedule control, monitoring and reporting, and configuration management.

Detailed drivers and assumptions assist in preparation of cost estimates. Each PBS is categorized into Work Breakdown Structure (WBS) activities that explain the work being performed at the WIPP.

The CBFO life-cycle cost estimates are based on the best data available. Information for the near-term (defined as five years) is based on detailed planning assumptions, work needed to accomplish the assumptions, and cost estimates for completing the work. The detailed estimates beyond the planning cycle are developed with less rigidity, because the scope of work in this period has not been defined to the same level of detail as the near-term. The CBFO estimates the WIPP life-cycle costs based on the mission to characterize, store, transport, and dispose of TRU waste, and the associated regulatory drivers.

The CBFO uses a budget and planning memorandum to initiate the annual budget process and has established a Change Control Board (CCB) for managing changes to the program. CBFO holds a monthly status meeting with WIPP program participants to obtain the status on scope, schedule, and cost variances, accomplishments, earned value performance, and potential issues and risks and their associated mitigating actions as necessary.

Risk identification, evaluation, mitigation, and management are conducted regularly as part of managing operations. Risk assessment is formally discussed between the federal and contractor staff during the monthly status meeting. The discussion is focused on early identification of risk changes, new risks and their priorities, and potential mitigating actions. Integrated risk monitoring, evaluation, and mitigation are an ongoing effort. See section 5.6 for further information about on-going risk management practices.

4.0 RISK SUMMARY

The primary mission of the CBFO is to protect human health and the environment by operating the WIPP for safe disposal of defense-related TRU waste (contact-handled [CH] and remote-handled [RH]), and by establishing an effective system for management of TRU waste from generation to permanent disposal. The federal risks are relatively few because the WIPP is an ongoing operation with over ten years of operating experience. The primary risks to the performance baseline are (1) the result of annual funding appropriations (i.e., to CBFO and/or other DOE TRU waste generator or storage

sites) that vary from baseline funding targets, and (2) insufficient utilization of the baseline capability to characterize, transport, and dispose waste at WIPP because of insufficient availability of waste from generator/storage sites for less than two years and greater than three months. These two risks are managed most closely, to the extent that there is control over them.

Based on WIPP's experience and safety record, additional risks related to government furnished services and items, procurements, regulatory compliance, contracts, and authorization basis are limited. These risks are projected for the near-term. The Management and Operating and the Transportation Contracts are scheduled for re-compete in fiscal year (FY) 2012. The Technical Assistance Contract was completed for a three-year term with two one-year options. No major construction activities are currently planned in the near-term. The risks are typically low for document review, regulatory submittals, and authorization basis submittals because operations are ongoing and the submittals are in the master schedule, are routine in nature, and CBFO has worked with the regulators for a number of years to establish good relationships and understand their expectations.

Critical Decisions are low risk and limited to one during the performance baseline. Critical Decision 2/3 was approved by the Acquisition Executive in January 2008. Finally, the continuity and current performance of the contractors minimize the few federal risks captured in the resource loaded schedule, and are addressed and/or discussed during the monthly project status meeting, as necessary.

5.0 RISK MANAGEMENT

5.1 Risk Identification

The purpose of the WIPP Integrated Project Team (WIPT) is to support project objectives, scope, schedule, cost, and performance in order to achieve the successful development and maintenance of the WIPP lifecycle baseline. The WIPT is led by Federal Project Directors and is composed of both DOE Federal staff and participant staff representing the various disciplines and participants at the WIPP with the specific knowledge, skills, and abilities necessary to support the successful execution of the current phase of the WIPP program. The CBFO Federal Project Directors for PBS CB-0080 and PBS CB-0090 are permanent members of the WIPT. Additional information on the WIPT is included in the PEP. The WIPT reviews and updates previously identified risks and adds risks that have emerged with the passage of time and continuing operations. Each individual risk is evaluated based on its specific probability and consequence. These are listed in the Risk Register and are shown as Attachment 1, sorted by PBS and then by overall risk and finally by worse case cost impact. Ownership of each risk is indicated and mitigating actions for each risk are included as appropriate.

5.2 Risk Assessment

Each WIPP participant (i.e., CBFO and contractors) meets, assigns ownership to each risk, and categorizes all significant risks into federal or contractor risks. DOE risks, for

example, could be a TRU waste funding shortfall at a site other than WIPP, or risks where CBFO is the main interface (i.e., regulators, State entities, DOE Headquarters, etc.) and would likely be the main negotiator for mitigation. Contractor risks are owned and mitigated by the M&O contractor or other WIPP participants, and have the potential to impact their scope, schedule, or costs.

The owner of the individual risk uses historical experience and expert judgment to assign cost impacts to each risk according to the following categories: best case, most likely, and worse case. With the identified risks, the participants categorize the risks by cost impacts (consequence) and probability of occurrence, and characterize the risks as high, medium, or low, according to the charts shown in the following three sections.

All risks listed in the register, along with the probability distribution of the consequence (cost impacts) and the probability distribution of occurrence and ownership (federal or contractor) by PBS, are input into a Monte Carlo simulation. Federal risks are included in the determination of DOE UC, and risks owned by the contractor are used to determine MR. Where a given risk impacts multiple PBS designations, a prorating of the cost impact of the risk is done by the proportion of each PBS to the total. In the 2005 life cycle cost (LCC) baseline, these proportions are as follows:

PBS CB-0080 Operations	78.2%
PBS CB-0090 Transportation	14.5%
PBS CB-0081 CCP	7.3%

5.2.1 Risk Event Consequences

The following chart provides the definitions associated with risk consequences (cost impacts).

Risk Consequence			
Consequence	Cost (Worst Case)	Or	Schedule
High	Need for increased baseline funding greater than \$200M.		Baseline extension or increased transportation and disposal capabilities for a period greater than 2 years to a maximum of 8 years.
Medium	Need for increased baseline funding greater than \$10M and less than \$200M.		Baseline extension or increased transportation and disposal capabilities for a period of between 6 months and 2 years.
Low	Need for increased baseline funding equal to or less than \$10M.		Less than 6 months schedule impact over the life of the operation.

Notes:

- All dollar estimates are in constant 2010 dollars.
- Schedule assumption is that increased transportation and disposal capacity over the baseline costs approximately \$5M per month.
- Permanent markers (e.g., Passive Institutional Controls [PICs]) are not included in the scope of work considered during the operational phase of the WIPP. This work is planned to be done years after the 2035 EM anticipated completion date for the project.

5.2.2 Risk Event Probability

The following table provides the definitions associated with the probabilities of occurrence of a given risk.

Risk Probability of Occurrence	
Very High	100% or multiple times between 2010 and 2030
High	50% to 99%
Medium	Between 11% and 49%
Low	Less than 10%

5.2.3 Risk Consequence Matrix

The probability and consequence of a particular risk are considered together in the following chart to give the overall risk assessment for each risk.

CBFO Risk Level Matrix				
Probability	<i>Very High</i>	Medium	High	High
	<i>High</i>	Medium	High	High
	<i>Medium</i>	Low	Medium	High
	<i>Low</i>	Low	Low	High
		<i>Low</i>	<i>Medium</i>	<i>High</i>
		Consequence		

5.3 Risk Analysis and Quantification

Each risk was designated as being included in one of four groups for budgeting purposes. These are PBS CB-0080, Operations; PBS CB-0090, Transportation; PBS CB-0081, CCP, or a combination of the three PBS categories.

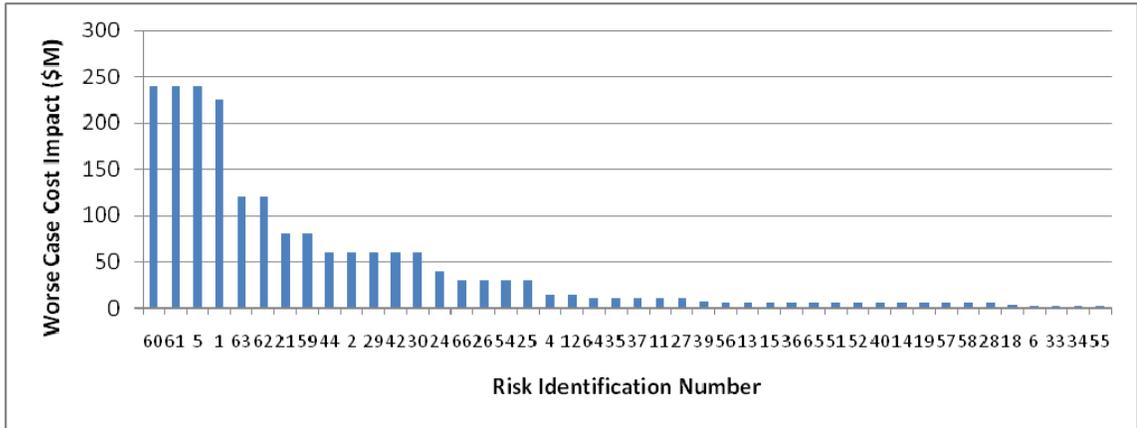
Applying these criteria, the overall risks shown in the register are assessed to be as shown in this table:

PBS	Low	Medium	High	Total
80	13	3	2	18
81	1		2	3
90	7	2		9
Mixed	3	2	9	14
Total	24	17	13	44

In addition, each risk was designated as being in either MR or the UC, based on ownership, as explained in section 5.2. The total number of risks in each category is shown in the following chart:

	Operations	Transportation	CCP	Mixed	Total
Management Reserve	12	4	1	8	23
Unfunded Contingency	6	5	2	6	21
Total	18	9	3	14	44

As to the cost impact (consequence) probability, four risks were assessed to have a worse case (upper bound) probability of over \$200M, one greater than Revision 3 of this plan. Sixteen risks were determined to have a worse case consequence probability of between \$15M and \$120M, and 24 have a worse case consequence probability of between \$1M and \$10M. This information is shown graphically here.



To provide risk quantification, all identified risks were analyzed using a Monte Carlo (MC) technique on June 14, 2010. This simulation was conducted using Crystal Ball™ simulation with 10,000 replicates (trials). Dollars and probabilities were assigned to each identified risk based on the probability of occurrence and consequence assessing best case, most likely case, and worse case scenarios for the latter probability. Each identified risk was analyzed at the 80 percent confidence level in light of the impact it would have if it occurred during the life of the project. The risks for six items were determined to have a probability of occurrence more than once during the remaining life of the program. They are listed in the following table.

Risk Item	Title	Monte Carlo value (\$M) @ 80% by PBS			Poisson
		Ops	CCP	Trans	
24	Appropriation	\$197.52	23.5	38.09	Y
39	Rising Fuel Costs			54.75	Y
51	WIPP Off-Normal CH	14.92			Y
52	WIPP Off-Normal RH	7.96			Y
62	Under-utilization of CH WIPP Capability	124.18	14.78	23.95	Y
63	Under-utilization of RH WIPP Capability	121.45	14.45	23.42	Y
65	Complex Off-Normal Event	29.71	3.53	5.73	Y
64	New Scope/Conflicting Priorities	4.86	.58	.94	Y

Two of these risks (24 and 39) had similar characteristics in the previous version of this plan. Of the 27, MC values for 17 risk items resulted in non-zero MC values. Five risk items categorized in the mixed PBS had MC values in each of the three PBSs. All other risks were determined to have a probability of occurring once during the remaining life of the project. Three events; the failure to receive a necessary level of baseline funding (# 24), and waste from generator sites not available (#s 62 & 63), accounted for a vast majority of the total calculated risk for MR and UC. This assumes that the occurrence rates for these events remains constant over the entire life cycle cost period, and that the occurrence of an event does not influence the likelihood of a subsequent event. The simulation was also set up such that MR and UC for each PBS could be derived.

5.4 DOE Unfunded Contingency and Management Reserve

In reviewing the risks associated with the project, the WIPT reviewed the scope of work for each contractor and assessed the risk for each participant based on the contractual obligations. Risk assessment and the mitigation actions identified for each risk are closely tied to the baseline cost estimated for these activities as all risks were analyzed in light of impacts to the baseline. As stated, UC and MR amounts were established by the MC simulation.

Because WIPP has been a highly successful operating facility for over a decade, there is a high degree of confidence in the cost estimates for the defined baseline scope for Transportation (PBS CB-0090), Operate Disposal Facility (PBS CB-0080), and CCP (PBS CB-0081). The amount identified by the risk quantification as federal risks constitutes the UC and is shown in the table below.

<i>Risk Quantification</i>	<i>Monte Carlo @ 80% Confidence Level</i>
Unfunded Contingency	
Operations	\$322.52M
Transportation	\$ 63.76M
CCP	\$ 67.37M
Management Reserve	
Operations	\$224.14M
Transportation	\$200.99M
CCP	\$ 50.18M

This table shows the relationship to the life-cycle cost estimates, the quantification of risks, and the resultant UC and MR for each PBS at an 80 percent confidence level. UC should be compared to the total life cycle cost estimate in constant dollars as of FY08, for the years FY04 to FY35 inclusive, estimated to be \$3.51 billion. Total costs in the MC at the 80 percent confidence level equaled \$746.44M, or 21.3 percent of the total estimated life cycle costs. MR across the three PBSs is similar to UC across all the PBS; therefore the conclusion is that MR and UC are each about 11 percent of total LCC. Note that adding quantitative values from the MC results is not appropriate and does not provide accurate results.

5.5 Risk Mitigation

A risk management approach (list of mitigating actions) is developed for each risk by the WIPT. The responsible managers assure that they are controlled through the normal management functions and work processes. Mitigating actions are also identified and are planned at the same time as risk identification. Funding for identified risk event mitigating actions is included in the cost estimates as part of the annual budget request process.

5.6 Risk Monitoring and Continual Assessment

In order to maintain the effectiveness of this plan, risks are monitored and changes in status of mitigating actions in those areas is communicated in regular management meetings. For areas of low risk, progress reviews ensure adequate attention. In addition, periodic reviews of programs shall be performed to determine if new areas of risk are identified and what risk management is appropriate. As the program conditions evolve and mature, and baseline changes are implemented, the risk strategies and mitigating actions are revised to reflect changing conditions through the baseline change control process as needed.

To ensure the plan is being reviewed and the mitigating actions assessed on a regular basis, the WIPT includes the status and effectiveness of the risk strategies and an assessment of the need to update the RMP and/or CBFO budget submittals as needed, but no less than annually, with the budget development cycle. In the next update to the RMP, CBFO will incorporate its experience and knowledge gained from interactions with the External Independent Review contractor, and plans to revisit the Risks Register (add risk and/or delete risks as necessary), revise the risk consequence table into less broad cost ranges, and include any other changes as necessary (e.g., combining the three PBSs into one PBS).

6.0 REFERENCES

DOE Order 413.3A, *Program and Project Management for the Acquisition of Capital Assets*

DOE/CBFO-94-1012, *Quality Assurance Program Document*, Current Revision. U.S. Department of Energy, Carlsbad Field Office, Carlsbad, New Mexico

DOE/CBFO 03-3293, *CBFO Project Execution Plan*. Current Revision. U.S. Department of Energy, Carlsbad Field Office, Carlsbad, New Mexico

DOE/WIPP 04-3300, *WIPP Project Control System Description*, Current Revision. U.S. Department of Energy, Carlsbad Field Office, Carlsbad, New Mexico

Attachment 1 - Risk Management Assessment

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results)												
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$Millions)			
									Best Case	Most Likely	Worse Case	
5	CB-0080- Operations	1.2.1 & 1.2.6	Waste hoist failure greater than six months, but less than one year.	Low	High	High	<ul style="list-style-type: none"> Evaluate the need to expedite capital equipment replacements and facility modifications Conduct designated maintenance outages Maintain/replenish spare parts Replace brake units as needed Procure spare deflection sheave inserts as needed Upgrade controls Maintain spare motor and ropes in stock Work additional hours/shifts on overtime to recover equipment downtime For major failures, continue to monitor the condition and take appropriate actions as authorized 	Contractor	120	120	240	
55	CB-0080- Operations	1.2.1 & 1.2.6	Actual waste inventory exceeds U/G disposal capacity.	Low	High	High	<ul style="list-style-type: none"> Monitor waste inventory estimates for early identification of additional disposal capacity requirements. See Item #6 	Contractor	0	0	1	
54	CB-0080- Operations	1.2.1 & 1.2.6	WIPP site CH or RH operations curtailed due to off-normal event greater than 30 days.	Medium	Medium	Medium	<ul style="list-style-type: none"> Conduct designated maintenance outages and replenish spare parts Evaluate the needed capital equipment replacements Maintain inventory of all single point of failure equipment and parts Maintenance worker overtime to recover equipment downtime For major failures, continue to monitor the condition and take appropriate actions as authorized Obtain Hazardous Waste Facility Permit (HWFP) modification for additional storage 	Contractor	5	10	30	
56	CB-0080- Operations	1.1.8	Expanding non-WIPP mission scope impacts WIPP infrastructure and operations.	High	Low	Medium	<ul style="list-style-type: none"> Identify and request budget requirements for additional infrastructure maintenance and support requirements. 	Federal	0	1	5	
6	CB-0080- Operations	1.2.1.3	Current emplacement method of RH TRU waste at WIPP does not allow available RH TRU to be disposed.	Very High	Low	Medium	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions Obtain regulatory approval for placing two RH canisters per borehole Obtain approval for use of shielded containers Design Panels 9 and 10 for necessary RH capacity See Item #55 	Federal	0	0	1	
1	CB-0080- Operations	1.5.1.1	Significant additional costs for Dismantlement and Decommissioning as identified in D & D Plan dated April 26, 2007.	Medium	Low	Low	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions if added cost is identified. 	Contractor	0	0	226	
2	CB-0080- Operations	1.2.5	Delay in permit modification request (PMR) for use of Hazardous Waste Disposal Units (HWDUs) Panels 9 - 10 greater than 60 days.	Low	Medium	Low	<ul style="list-style-type: none"> Expedite approval process by working with New Mexico Environment Department (NMED) Build inventory of characterized waste at generator sites, then expedite shipments once PMR is approved 	Federal	10	10	60	
4	CB-0080- Operations	1.4.1	Site QA program certification withdrawn by the Environmental Protection Agency (EPA) greater than 60 days.	Low	Medium	Low	<ul style="list-style-type: none"> Maintain an effective CBFO QA program If withdrawal occurs, initiate corrective action plan 	Federal	10	10	15	

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results) (Continued)											
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$millions)		
									Best Case	Most Likely	Worse Case
12	CB-0080- Operations	1.2.6	Salt hoist failure less than 6 months.	Low	Low	Low	<ul style="list-style-type: none"> • Conduct designated maintenance outages • Upgrade controls • Maintain baseline spare parts holdings • Perform mechanical renovation, as necessary • Maintenance worker overtime as needed to recover equipment downtime • Evaluate needed capital equipment replacements and facility modifications • For major failures, continue to monitor the condition and take appropriate actions 	Contractor	0	0	15
11	CB-0080- Operations	1.2.1 & 1.2.6	Waste hoist failure less than 60 days.	Low	Low	Low	See Item #5	Contractor	1	7.5	10
13	CB-0080- Operations	1.1.8	WIPP Waste Information System (WWIS) out of service greater than 15 days.	Low	Low	Low	<ul style="list-style-type: none"> • Provide redundant equipment as covered in the baseline OR • Monitor the condition and take appropriate actions as authorized • Periodically review and upgrade system as necessary 	Federal	2.5	2.5	5
14	CB-0080- Operations	1.1.8	TRANSCOM out of service greater than 15 days.	Low	Low	Low	<ul style="list-style-type: none"> • Provide redundant equipment as covered in the baseline • Monitor the condition and take appropriate actions as authorized 	Contractor	1	1	5
19	CB-0080- Operations	1.4.2	Failure of WIPPNet hardware causing system outage greater than 15 days.	Low	Low	Low	<ul style="list-style-type: none"> • Redundant equipment as included in baseline • Conduct designated maintenance and maintain designated spare parts 	Contractor	2.5	2.5	5
51	CB-0080- Operations	1.2.1 & 1.2.6	WIPP site CH operations curtailed due to off-normal event less than 30 days.	Medium	Low	Low	<ul style="list-style-type: none"> • Conduct designated maintenance outages and replenish spare parts • Evaluate the needed capital equipment replacements • Maintenance worker overtime to recover equipment downtime • For major failures, continue to monitor the condition and take appropriate actions as authorized 	Contractor	0	2.5	5
52	CB-0080- Operations	1.2.1 & 1.2.6	WIPP site RH operations curtailed due to off-normal event less than 30 days.	Low	Medium	Low	<ul style="list-style-type: none"> • Conduct designated maintenance outages and replenish spare parts • Evaluate the needed capital equipment replacements • Maintain inventory of all single point of failure equipment and parts • Maintenance worker overtime to recover equipment downtime • For major failures, continue to monitor the condition and take appropriate actions as authorized 	Contractor	0	2.5	5
57	CB-0080- Operations	1.1.8	Off-normal event affects non-WIPP mission scope.	Low	Low	Low	<ul style="list-style-type: none"> • Identify and request budget requirements for additional infrastructure maintenance and support requirements. • Maintain inventory of all single point of failure equipment and parts 	Contractor	0	1	5

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results) (Continued)											
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$millions)		
									Best Case	Most Likely	Worse Case
58	CB-0080- Operations	1.4.2	Labor agreement allows for legal right to strike at expiration of contract. Labor dispute of greater than 2 weeks.	Low	Low	Low	<ul style="list-style-type: none"> Assure meaningful and open negotiations to avoid work stoppage Have alternate qualified staff available to continue operations 	Contractor	2.5	2.5	5
18	CB-0080- Operations	1.4.2	Internal disgruntled personnel/external adversary disrupts site operations.	Low	Low	Low	<ul style="list-style-type: none"> Maintain Employee Assistance Programs and fitness for duty requirements Maintain security presence with internal patrols and prohibited article searches Continued security presence at site with patrol capability Maintain working relationships including existing Memorandums of Understanding with local law enforcement agencies 	Federal	0	0	2.5
60	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Complex capability to retrieve, characterize, and transport CH waste to WIPP not sufficiently utilized. Waste from generator/storage sites not sufficiently available for a minimum of 2 years.	Low	High	High	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions Reallocate resources to where waste is available for characterization, transportation and disposal Align project contract milestones at sites to support WIPP program 	Federal	120	120	240
61	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Complex capability to retrieve, characterize, and transport RH waste to WIPP not sufficiently utilized. Waste from generator/storage sites not sufficiently available for a minimum of 2 years.	Low	High	High	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions Use shielded containers Use neutron shielding for removable lid canisters (RLCs) Reallocate resources to where waste is available for characterization, transportation and disposal Align project contract milestones at sites to support WIPP program 	Federal	120	120	240
62	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Complex capability to retrieve, characterize, and transport CH TRU waste to WIPP not sufficiently utilized. Waste from generator/storage sites not sufficiently available for less than 2 years and greater than 3 months.	Very High	Medium	High	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions Reallocate resources to where waste is available for characterization, transportation and disposal Align project contract milestones at sites to support WIPP program 	Contractor	15	15	120
63	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Complex capability to retrieve, characterize, and transport RH TRU waste to WIPP not sufficiently utilized. Waste from generator/storage sites not sufficiently available for less than 2 years and greater than 3 months.	Very High	Medium	High	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions Use shielded containers Use neutron shielding for RLC Reallocate resources to where waste is available for characterization, transportation and disposal Align project contract milestones at sites to support WIPP program 	Federal	15	15	120
21	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.2.3	EPA does not recertify WIPP in a subsequent recertification cycle. Maximum delay of 4 months.	Low	High	High	<ul style="list-style-type: none"> Conduct information exchanges with EPA (experience from previous Certification Applications, timely and accurate response to EPA, and implementation of recertification terms and conditions) Maintain cooperative relationship with the EPA 	Federal	0	20	80

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results) (Continued)											
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$millions)		
									Best Case	Most Likely	Worse Case
59	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.2.4	NMED does not approve HWFP renewal. Maximum delay of 4 months.	Low	High	High	<ul style="list-style-type: none"> Conduct information exchanges with NMED Maintain cooperative relationship with the NMED 	Federal	0	20	80
24	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.4.2	Inadequate appropriations greater than \$5 M. Baseline funding inadequate.	Very High	Medium	High	<ul style="list-style-type: none"> Continue to monitor the condition and take appropriate actions 	Federal	5	10	40
26	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.4.2	Fatality at WIPP involving waste processing activities.	Low	High	High	<ul style="list-style-type: none"> Safety programs and oversight provided by the M&O contractor CBFO health and safety oversight 	Contractor	2.5	15	30
66	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Operations within the complex curtailed due to off-normal events greater than 30 days but less than 6 months.	Low	High	High	<ul style="list-style-type: none"> Monitor and take actions as necessary (e.g., request budget during annual budget requests; request sites and WIPP to work overtime) Submit Baseline Change Proposal (BCP) to Headquarters (HQ) requesting change and adjust baseline accordingly Conduct maintenance outages Maintain spare parts inventory 	Federal	5	10	30
64	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.4.2	New scope without resources creates competition for resources, conflicting priorities, and risk to completion of projects.	High	Low	Medium	<ul style="list-style-type: none"> Continue to replan resources between PBSs. 	Federal	0	5	10
65	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.1.8	Operations within the complex curtailed due to off-normal events greater than 7 days but less than 30 days.	High	Low	Medium	<ul style="list-style-type: none"> Monitor and take actions as necessary (e.g., request budget during annual budget requests; request sites and WIPP to work overtime) Submit BCP to HQ requesting change and adjust baseline accordingly Conduct maintenance outages Maintain spare parts inventory 	Contractor	1.5	2.5	5
25	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.2.1 & 1.2.6	Salt hoist failure greater than six months.	Low	Medium	Low	See Item #12	Contractor	30	30	30
27	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.4.2	Accident at WIPP results in release.	Low	Medium	Low	<ul style="list-style-type: none"> Safety programs and oversight provided by the M&O contractor CBFO health and safety oversight 	Contractor	0.5	1	10
28	CB-0080/0081/0090 – Operations/CCP/Transportation (Mixed)	1.2.6	Unexpected back (roof) failure in waste haulage route or active room with no injuries.	Low	Low	Low	<ul style="list-style-type: none"> Provide geotechnical monitoring to observe conditions and evaluate Continue active ground control program. Install additional ground support as required Conduct designated maintenance outages for ground control in waste handling areas/waste haulage route Develop alternate haul route Work additional hours/shifts on overtime to recover 	Contractor	0	0	5

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results) (Continued)											
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$millions)		
									Best Case	Most Likely	Worse Case
42	CB-0081 – Central Characterization Project (CCP)	1.1.8	Characterization rejection rates higher than anticipated or generator sites lack sufficient capacity to remediate rejected waste causing CCP inefficiencies.	Very High	Medium	High	<ul style="list-style-type: none"> • Prescreen/re-package waste prior to full characterization • Work with generator sites and headquarters to increase remediation capacity 	Contractor	10	20	60
44	CB-0081 – Central Characterization Project (CCP)	1.1.8	Generator sites budget inadequate for desired throughputs of TRU Waste causing CCP inefficiencies.	High	Medium	High	<ul style="list-style-type: none"> • Work with generator sites and headquarters to increase funding • Use CBFO resources elsewhere • Use baseline contingency to pre-mitigate risk 	Federal	10	20	60
15	CB-0081 – Central Characterization Project (CCP)	1.1.8	Loss of laboratory headspace gas (HSG)/solids analysis capability greater than 15 days.	Low	Low	Low	<ul style="list-style-type: none"> • Work with other DOE offices to ensure adequate funding is provided to continue HSG/solids analysis capability at INL TWCP • Establish HSG capability at Carlsbad Environmental Monitoring and Research Center (CEMRC) 	Federal	0	0	5
30	CB-0090 – Transportation	1.3.4	Delay in large box program (containers and screening equipment) that impacts generator site state compliance agreements.	High	Low	Medium	<ul style="list-style-type: none"> • Repackage waste into standard waste boxes (SWBs) 	Contractor	0	0	60
36	CB-0090 – Transportation	1.1.8	Shipment delays caused by weather greater than 30 cumulative days in a year.	High	Low	Medium	<ul style="list-style-type: none"> • Schedule more shipments in the spring and summer than in winter from Northern States 	Contractor	0	5	5
29	CB-0090 – Transportation	1.4.2	Traffic accident with a radiation release.	Low	Medium	Low	<ul style="list-style-type: none"> • Transport waste in Nuclear Regulatory Commission certified Type B casks • Transportation safety programs by contractors • Transportation equipment maintenance program • Emergency responder training on transportation routes • Perform periodic recovery exercises 	Federal	5	5	60
35	CB-0090 – Transportation	1.1.8	National directed transportation shutdown greater than 30 days.	Low	Low	Low	<ul style="list-style-type: none"> • Prioritize and recover shipments as resources are available 	Federal	5	5	10
37	CB-0090 – Transportation	1.4.2	Traffic accident with a fatality.	Low	Low	Low	<ul style="list-style-type: none"> • Transportation safety programs by contractors • Transportation equipment maintenance programs 	Federal	5	5	10
39	CB-0090 – Transportation	1.1.8	Increase in fuel costs for carrier contract by greater than 100% (\$3/gal baseline adjusted for inflation).	Medium	Low	Low	<ul style="list-style-type: none"> • Monitor and take action as necessary • Submit BCP to HQ requesting changes and adjust baseline accordingly • Evaluate costs of alternative fuels (e.g., bio diesel, etc.) 	Contractor	1	4	7

CBFO Risk Register (Rev 4 -- by PBS, Risk, Impact, duplicate lines hidden, no MC results) (Continued)											
Risk ID #	PBS	WBS	Risk Description	Probability	Consequence	Overall Risk	Mitigation Actions	Ownership	Cost Impacts (\$millions)		
									Best Case	Most Likely	Worse Case
40	CB-0090 – Transportation	1.3.2	Unavailability of greater than 20% of the TRUPACT II/ HalfPACT fleet.	Low	Low	Low	<ul style="list-style-type: none"> • Maintain TRUPACT maintenance and repair program and capabilities • Minimize campaigning strategies • Establish integration and prioritization of shipments • Procure additional TRUPACTs/HalfPacts • Build a backlog of weight limited/fissile gram equivalent (FGE) limited TRU waste • Continue to characterize waste for future shipments 	Contractor	1	1	5
33	CB-0090 – Transportation	1.4.2	Loss of State(s) vehicle inspection capability and/or emergency response capability.	Low	Low	Low	<ul style="list-style-type: none"> • Work issues with states early • Maintain good working relationships with states 	Federal	0	0	1
34	CB-0090 – Transportation	1.4.2	Greater than 30% driver teams unavailable (labor dispute).	Low	Low	Low	<ul style="list-style-type: none"> • Have contracts in place to provide adequate staffing and flexibility 	Federal	0	0	1

Unanalyzed Risks—Beyond Baseline Parameters

	Description of Condition	Actions
45	More RH and/or CH TRU waste is discovered or generated than is authorized for disposal at WIPP by the Land Withdrawal Act	Monitor TRU inventory and disposal quantities and initiate action if a high probability of occurrence develops.
46	DOE needs a TRU waste disposal facility beyond 2030 (the EM baseline anticipated completion date for WIPP disposal)	Monitor long-term DOE TRU waste disposal needs and initiate action by 2020, if WIPP disposal is required after 2030.
47	Congress continues to fund Land Withdrawal Act highway payments to the State of New Mexico beginning in 2012 @ \$30M (from the WIPP budget) each year escalated.	
48	Other significant “unknown unknown” costs (e.g., significant unanticipated costs or significant changes to the baseline drivers and assumptions).	

Opportunities:

49	D&D costs will be reduced through re-design of shaft seal and other engineering projects prior to closure.	Demonstrate cost savings scenarios, and monitor other D&D programs as technology matures
50	Shielded containers are approved as a cost saving alternative to RH waste disposal.	